

Serial No.: 10/796,704
Examiner: Delma R. Flores Ruiz
Title: SEMICONDUCTOR LASER DEVICE AND OPTICAL PICK UP APPARATUS USING THE SAME
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Amendments to the Claims:

This listing of claims will replace all prior versions, and listing, of claims in the application.

1-15. (Cancelled)

16. (Currently amended) A semiconductor laser device formed on a tilted substrate composed of a compound semiconductor, comprising an active layer and two cladding layers interposing the active layer therebetween,

wherein one of the cladding layers forms a mesa-shaped ridge,
the ridge includes a first region where a width of a bottom portion of the ridge is constant along an optical path direction, and a second region where the width of the bottom portion of the ridge is varied continuously in the optical path direction,

the second region is placed between the first region and an end face in an optical path,

the width of the bottom portion of the ridge in the second region is increased with distance from the first region,

the width of the bottom portion of the ridge in the first region is in a range of 1.8 μ m to 2.5 μ m,

the width of the bottom portion of the ridge in the second region is in a range of 2.4 μ m to 3 μ m,

a resonator length is in a range of 800 μ m to 1500 μ m, and

a length of the first region is 10% to 50% with respect to the a-resonator length.

17. (Cancelled)

18. (Currently amended) The semiconductor laser device according to claim 16 [[17]],

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wherein the length of the first region is 10% to 20% with respect to the resonator length.

19. (Currently amended) The semiconductor laser device according to claim 16 [[17]],

wherein the length of the first region is 100 μm or more, and the resonator length is in a range of 800 μm to 1200 μm .

20. (Currently amended) The semiconductor laser device according to claim 16 [[17]],

wherein a differential resistance R_s in current voltage characteristics is 6.5 Ω or less.

21. (Canceled)

22. (Previously presented) The semiconductor laser device according to claim 16,

wherein the second region is placed between the first region and one end face in the optical path, and between the first region and the other end face in the optical path.

23. (Previously presented) The semiconductor laser device according to claim 16,

wherein at a boundary between the first region and the second region, the width of the bottom portion of the ridge in the first region is substantially the same as that in the second region.

24. (Previously presented) An optical pickup apparatus, comprising a semiconductor laser device as claimed in claim 16 and a light-receiving portion for

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receiving light output from the semiconductor laser device and reflected from a recording medium.

25. (Previously presented) The optical pickup apparatus according to claim 24, further comprising a light-splitting portion for splitting the reflected light,

wherein the light-receiving portion receives the reflected light split by the light-splitting portion.

26. (Previously presented) The optical pickup apparatus according to claim 24, wherein the semiconductor laser device and the light-receiving portion are formed on the same substrate.

27-28. (Canceled)

29. (New) The semiconductor laser device according to claim 16, wherein the resonator length is in a range of 900 μm to 1200 μm .

30. (New) A semiconductor laser device formed on a tilted substrate composed of a compound semiconductor, comprising an active layer and two cladding layers interposing the active layer therebetween,

wherein one of the cladding layers forms a mcsa-shaped ridge,
the ridge includes a first region where a width of a bottom portion of the ridge is constant along an optical path direction, and a second region where the width of the bottom portion of the ridge is varied continuously in the optical path direction,

the second region is placed between the first region and an end face in an optical path,

the width of the bottom portion of the ridge in the second region is increased with distance from the first region,

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the width of the bottom portion of the ridge in the first region is in a range of 1.8 μm to 2.5 μm ,

a difference between the width of the bottom portion of the ridge in the first region and a maximum width of the bottom portion of the ridge in the second region is 0.5 μm or less,

a resonator length is in a range of 800 μm to 1500 μm , and

a length of the first region is 10% to 50% with respect to the resonator length.

31. (New) The semiconductor laser device according to claim 30,

wherein the length of the first region is 10% to 20% with respect to the resonator length.

32. (New) The semiconductor laser device according to claim 30,

wherein the length of the first region is 100 μm or more, and the resonator length is in a range of 800 μm to 1200 μm .

33. (New) The semiconductor laser device according to claim 32,

wherein a differential resistance R_s in current voltage characteristics is 6.5 Ω or less.

34. (New) The semiconductor laser device according to claim 30,

wherein the second region is placed between the first region and one end face in the optical path, and between the first region and the other end face in the optical path.

35. (New) The semiconductor laser device according to claim 30,

wherein at a boundary between the first region and the second region, the width of the bottom portion of the ridge in the first region is substantially the same as that in the second region.

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36. (New) An optical pickup apparatus, comprising a semiconductor laser device as claimed in claim 30 and a light-receiving portion for receiving light output from the semiconductor laser device and reflected from a recording medium.
37. (New) The optical pickup apparatus according to claim 36, further comprising a light-splitting portion for splitting the reflected light, wherein the light-receiving portion receives the reflected light split by the light-splitting portion.
38. (New) The optical pickup apparatus according to claim 36, wherein the semiconductor laser device and the light-receiving portion are formed on the same substrate.
39. (New) The semiconductor laser device according to claim 30, wherein the resonator length is in a range of 900 μm to 1200 μm .